—After giving illustrations of the present chaotic state of cryptogamic terminology, the authors proceed to state that the object they have kept in view is to arrive at a system which shall be symmetrical and in accordance with the state of knowledge, and which shall at the same time interfere as little as possible with existing terms. A few new terms are introduced, but the total number is greatly reduced.

In the fourth edition of his "Lehrbuch" Sachs defines a "spore" as "a reproductive cell produced directly or indirectly by an act of fertilisation," reserving the term "gonidium" for those reproductive cells which are produced without any previous act of impregnation. The practical objections to this limitation of terms are pointed out, and it is proposed to restore the term *spore* to what has been in the main hitherto its ordinary signification, viz., *any cell produced by ordinary processes of vegetation, and not by a union of sexual elements, which becomes detached for the purpose of direct vegetative reproduction.* The spore may be the result of ordinary cell-division or of free cell-formation. In certain cases (*zoospores*) its first stage is that of a naked mass of protoplasm; in rare instances it is multicellular, breaking up into a number of cells (*polyspores*, composed of *merispores*, or breaking up into *sporidia*). Throughout thallophytes the term is used in the form of one of numerous compounds expressive of the special character of the organ in the class in question. Thus, in the protophyta and mucorini we have *chlamydospores;* in the myxomycetes, *sporangiospores;* in the peronosporeæ, *conidiospores;* in the saprolegnieæ, oophyceæ, and some zygophyceæ, *zoospores;* in the uredineæ, *teleutospores*, *æcidiospores*, *uredospores*, and *sporidia;* in the basidiomycetes, *basidiospores;* in the ascomycetes (including lichenes), *conidiospores*, *stylospores*, *ascospores*, *polyspores*, and *merispores;* in the hydrodictyeæ, *megaspores;* in the desmidieæ, *auxospores;* in the volvocineæ and mesocarpeæ, *parthenospores;* in the siphoneæ and botrydieæ, *hypnosporrs;* in the œdogoniaceæ, *androspores;* in the floridieæ, *tetraspores* and *octospores*. The cell in which the spores are formed is in all cases a *sporangium*.

In the terminology of the male fecundating organs very little change is necessary. The cell or more complicated structure in which the male element is formed is uniformly termed an *antheridium*, the ciliated fecundating bodies *antherozoids* (in preference to "spermatozoids"). In the floridieæ and lichenes, the fecundating bodies are destitute of vibratile cilia; in the former case they are still usually termed "antherozoids," in the latter "spermatia," and their receptacles "spermogonia." In order to mark the difference in structure from true antherozoids, it is proposed to designate these motionless bodies in both cases *pollinoids;* the term "spermogonium" is altogether unnecessary, the organ being a true antheridium.

A satisfactory terminology of the female reproductive organs presents greater difficulties. The limits placed to the use of the term spore and its compounds require the abandonment of "oospore" for the fertilised oosphere in its encysted stage anterior to its segmentation into the embryo. The authors propose the syllable *sperm* as the basis of the various terms applied to all those bodies which are the immediate result of impregnation. It is believed that it will be found to supply the basis of a symmetrical system of terminology which will go far to redeem the confusion that at present meets the student at the outset of his researches. For the unfertilised female protoplasmic mass, it is proposed to retain the term *oosphere*, and to establish from it a corresponding series of terms ending in *sphere*. The entire female organ before fertilisation, whether unicellular or multicellular, is designated by a set of terms ending in *gonium*.

In the zygomycetes and zygophyceæ, the conjugated *zygospheres*, or contents of the *zygogonia*, constitute a *zygosperm;* in the oomycetes and oophyceæ the fertilised *oosphere*, or contents of the *oogonium*, is an *oosperm;* in the carpophyceæ the fertilised *carposphere*, or contents of the *carpogonium*, constitutes a *carposperm*. In this last class the process is complicated, being effected by means of a special female organ which may be called the *trichogonium* (in preference to "trichogyne"). The ultimate result of impregnation is the production of a mass of tissue known as the *cystocarp* (or "sporocarp"), within which are produced the germinating bodies which must be designated *carpospores*, since they are not the direct results of fertilisation. In the carpomycetes no similar process is at present known. Any one of these bodies which remains in a dormant condition for a time before germinating is a *hypnosperm*. In the cormophytes (characeæ, muscineæ, and vascular cryptogams) the fertilised *archesphere*, or contents of the *archegonium*, is an *archesperm*.

In the basidiomycetes, ascomycetes, and some other classes, it is proposed to substitute the term *fructification* for "receptacle," for the entire non-sexual generation which bears the spores.

In the discussion which followed, Prof. Rolleston and Prof. I. B. Balfour took part, the latter objecting to the proposed alterations in classification and terminology in several points. He believes all the schizomycetes to be degraded ascomycetes, and prefers Sachs' classification of the vascular cryptogams. He also objected to the use of the term "sperm" in the sense proposed.

Further Remarks on the Mollusca of the Mediterranean, by J. Gwyn Jeffreys, LL.D., F.R.S.—At the Bradford Meeting of the Association in 1873 I made some remarks on the Mollusca of the Mediterranean, and gave a list of those species which had not yet been noticed as Atlantic, being then 222 in number. Since that time many of the species have been discovered in the Atlantic, or been ascertained to be varieties of other well-known Atlantic species. This list will be found in pages 113 to 115 of the Report. I will now give a list of those Mediterranean species which are also Atlantic, or varieties of other species, on the authority of the Marquis de Monterosato, the Marquis de Folin, Dr. Fischer, the Rev. Mr. Watson, and myself.

BRACHIOPODA.—*Argiope cordata*, Risso; *Thecidium mediterraneum*, Risso. CONCHIFERA.—*Pleuronectia lævis*, Jeffreys, a monstrosity of *Pecten similis; Mytilus minimus*, Poli; *Nucula convexa*, J. = *L. ægensis*, Forbes, young; *Leda oblonga*, J. = *L. micrometrica*, Seguenza; *L. subrotunda*, J. = *L. minima*, Seg.; *Solenella cuneata*, J. (*Malletia*); *Venus cygnus*, Lamarck = *V. nux*, Gmelin; *Pecchiolia insculpta*, J. (*Verticordia*). GASTROPODA.—*Emarginula adriatica*, O. G. Costa; *Trochus scabrosus*, J. = *T. gemmulatus*, Philippi; *Fossarus costatus*, Brocchi; *Rissoa caribæa*, D'Orbigny; *R. rudis*, Ph.; *R. maderensis*, J.; *Cæcum chiereghinianum*, Brusina = *C. glabrum*, Montagu, variety; *Vermetus triquetra*, Bivona; *Scalaria cantrainei*, Weinkauff; *Odostomia polita*, Biv.; *O. tricincta*, J.; *O. fasciata*, Forb.; *Eulima microstoma*, Brus.; *E. jeffreysiana*, Brus.; *Natica dillwynii*, Payraudeau; *N. marmorata*, H. Adams; *Solarium pseudoperspectivum*, Brc.; *Xenophora mediterranea*, Tiberi; *Cerithium costatum*, Da Costa; *C. elegans*, De Blainville; *Triton seguenzæ*, Aradas and Benoit = *T. nodifer*, Lam., var.; *Lachesis folineæ* (*Delle Chiaje*) Ph.; *Cassidaria echinophora*, Linné; probably *C. tyrrhena*, Chemnitz, is a variety; *Defrancia hystrix*, De Cristofori and Jan.; *Pleurotoma pusilla*, Scacchi = *P. multilineolata*, Deshayes, var.; *Cyprææ physis*, Brc.? *Utriculus striatulus*, J.; *Akera fragilis*, J.; *Diphyllidia lineata*, Otto; *D. pustulosa*, Sc. Total 41 species.

This reduces the number of supposed exclusively Mediterranean species from 222 to 181; and it must be borne in mind that the Atlantic Nudibranchs and Cephalopods have never been completely worked out. Philippi's list of Mediterranean Nudibranchs and Verany's list of Mediterranean Cephalopods amount to 58 out of the above residue of 181. When further researches by dredging have been made in the North Atlantic, I believe the difference between the Mollusca in that extensive ocean and in the Mediterranean will be still more diminished, if it do not in time altogether disappear.

THE MEETING OF THE IRON AND STEEL INSTITUTE AT DÜSSELDORF

THE recent meeting of the Iron and Steel Institute at Düsseldorf was peculiarly interesting, as illustrating the international character of the Society, and also because of the opportunity which it afforded to English members of studying German workshops and methods of manufacture. The papers which were read were mostly by German authors, and dealt with many subjects of importance to those interested in the manufacture of iron and steel. Many of them were of too technical a character to be noticed at length in these pages, but as an exception we may mention the paper on "The Dephosphorisation of Iron in the Converter," by Herr J. Massenez of Hoerde in Westphalia.

This subject has received great attention at the recent meetings of the Institute, but not more so than its importance deserves. We referred at length to the basic process of dephosphorising pig iron, when reviewing the proceedings at the spring meeting, and the paper now before us contains a most satisfactory record of results since attained, together with much valuable information as to the chemical changes which take place during the conversion. The method is best known by the names of the

inventors, Messrs. Thomas and Gilchrist, and its great importance lies in the fact that it enables Bessemer steel and a very pure homogeneous iron to be produced from the poor class of phosphoric iron ore which abounds in the Cleveland district and also in the basin of the Saar, and in Lorraine and Luxembourg, which ores have not hitherto been available for the production of steel, on account of the difficulty of eliminating the phosphorus, the presence of which element is well known to be highly detrimental to the quality of the steel. To the Germans this invention is possibly of greater value than to ourselves, on account of the prevalence with them of the poorer class of ore, and the comparative scarcity of hematite.

At the present moment five German companies are working the Thomas-Gilchrist process, and in the course of a few months many others will be in a position to follow suit.

Herr Massenez gives in his paper a series of chemical analyses, showing the composition of the metal at different stages during the blow. The information contained in these tables is also exhibited graphically by diagrams, in which the quantities of the various elements at the different stages are represented by the ordinates of curves. These "show that so long as the silicon is in combustion the phosphorus not only is not attacked, it actually increases. First of all, as is well known, the silicon is attacked, and is reduced to a mere trace at the expiration of two minutes. A portion of the carbon burns off at the same time with the silicon; however, only after the silicon is reduced does the carbon curve descend rapidly. The manganese curve is from the commencement to the end of the blow regularly decensional, showing that this body oxidises but slowly. The small quantity of copper disappears after the end of the first minute's blow. Surprising is the fact that the sulphur-curve slowly rises till the commencement of the after-blow, and then only decreases partially, or very slowly, at the latter end of the same. The phosphorus is energetically consumed in large quantities *after* decarbonisation has taken place, and its combustion is the cause of the high temperature at the end of the process. At the commencement of the blow, and during the time the silicon is oxidising, the phosphorus increases in the metal in the proportion as caused by the lessening of the volume of pig iron through the combustion of silicon, manganese, and carbon. After the reduction of the silicon, and during the period the carbon is reduced from 2·72 per cent. to 0·16 per cent., only a fraction of the carbon disappears (from 1·32 per cent. to 1·18 per cent.); afterwards the very rapid combustion of this body takes place, leaving only a trace of the same, a reaction which characterises the whole process."

It is satisfactory to learn from this paper that the chemistry of the process is now thoroughly understood, and that the only difficulties which remain to be overcome are of a purely mechanical nature, and are principally due to the shortness of life of the converter bottoms. The discussion which followed was fully equal in interest to the paper itself, and was taken part in by most of the leading members of the Institute. It bore principally upon the commercial side of the invention, which has hitherto been its weak point. We learn, however, that well-founded hopes are entertained that this last difficulty in the way of a general introduction of the process is in a fair way of being removed.

In our last review of the proceedings of this Institute we noticed a paper by Prof. Akerman, on "The Hardening of Iron and Steel." This paper, which was taken as read at the spring meeting, was discussed at Düsseldorf. Most of the opinions expressed were necessarily of a rather speculative character, for very little is really known as to the *rationale* of hardening and tempering. Many eminent authorities seemed, however, to be agreed that carbon exists in iron and steel in three separate forms, and not in two only, as has hitherto been supposed, and that the hardening is due only to one of these forms. A point of great practical importance was referred to by Mr. Adamson, viz., the prevalent practice of endeavouring to strengthen steel by tempering in oil. This practice was strongly condemned by Mr. Adamson. He maintains that the dipping in oil, though it may increase the tensile strength of the metal, impairs its elasticity and ductility. We commend this opinion to the attention of the authorities at Woolwich Arsenal. It is well known that the steel barrels of all our guns are tempered by immersion in oil, and if Mr. Adamson's statements be correct, it is not to be wondered at that so many disappointing failures have taken place.

The last paper to which we shall refer dealt with the subject of iron permanent way. It contained an account of the experience obtained on the German state railways of the use of iron instead of timber for sleepers. There are few subjects of greater importance to ironmasters than this substitution of iron for woodwork in the permanent ways of railways, for the amount of metal which would thus be consumed is almost incalculable. The paper, which was read by Privy-Councillor Grüthefein, embodies much valuable information as to the different systems of iron permanent way at present in use. From it we learn that there are at the present moment 1,542 kilometres of line in Germany laid with the new description of sleeper, and that the results obtained are so satisfactory that the system is being continually extended. It is interesting to notice that in Germany the new sleepers are mostly laid on the longitudinal plan, a system which has not given satisfaction in this country. In the discussion which followed, the opinion was strongly stated by English engineers that longitudinal sleepers would be absolutely incapable of withstanding the effects of the very heavy and fast traffic of the main lines in this country.

In conclusion we must congratulate the Iron and Steel Institute on the extended sphere of usefulness and the cosmopolitan character which it has gained by going out of the beaten track, and holding an autumn meeting on the Continent.

ANNUAL CONGRESS OF THE GERMAN ANTHROPOLOGICAL SOCIETY

THE Eleventh General Meeting of the German Anthropological Society was held at Berlin during the past month, Prof. Virchow taking the chair and acting as president at each of the six sittings. At the opening sitting, after speeches by Herr von Gossler and the President, in which they reviewed the past and the present condition of the Society, and notably drew attention to its aims and its achievements, Herr Friedel gave a short exposition of his paper "On Prehistoric Discoveries made in Berlin and its Neighbourhood." This was followed by an interesting address from Dr. Schliemann respecting the site of Troy. He re-stated his now well-known convictions, and gave considerable evidence in support of the belief that Homer's Troy was not merely a mythical town, but that it had once actually filled a place in the world's history. "I wish," said the Doctor, "I wish that I were able to prove Homer to have been an eye-witness of the Trojan war. But unfortunately this is impossible. In his day swords were in general use as a weapon, and iron well known as a metal; in Troy, again, swords were unheard of, while of iron the inhabitants knew nothing whatever. So, too, the manners, the customs and the general civilisation which he describes are of an epoch that is centuries later than the one to which the results of my excavations belong. Homer presents to us the legend of Ilium's tragic fate in the form which it had been handed down to him by the bards who had gone before; and, as we have already seen, he invests the traditional account of the war and of the fall of Troy with the colouring of the time in which he lived. Yet he was not without personal knowledge of the actual localities, for his descriptions (both the general one of Troy itself, as also of the plains of Troy in particular) are, if taken as a whole, quite accurate and truthful." At the close of his address, Dr. Schliemann announced his intention of commencing a series of excavations on the site of Orchomenos in Bœotia, the prehistoric capital of the Minyans, on his return to Athens, the Greek Government having accorded him full permission to do this.

At the second sitting, on August 6, after a short address by the President, Prof. Ranke spoke at some length upon the subject of German ethnology and anthropology, pointing out the distinct advance that these sciences had made, and citing, as helps to study, the several important works which had appeared in the country by Lindenschmit, Arnold, Bracht, Poppe, Genthe, v. Sadowski, and other distinguished anthropologists. He specially called attention to the progress that had been made in the science of craniology, it being now nearly always possible to distinguish between a male and a female skull. Prof. Virchow then briefly put forward the proposition that the next (the twelfth) session of the Society should be held at Ratisbon, a town which, for many reasons, he thought was well fitted to serve such purpose. This proposal was carried unanimously; and after an address by Herr Friedel the meeting was adjourned.